

What is claimed is:

1. A preventive or ameliorating agent for liver diseases associated with hepatopathy comprising an omega-9 unsaturated fatty acid or a compound having an omega-9 unsaturated fatty acid as a constituent fatty acid.

2. The preventive or ameliorating agent for liver diseases associated with hepatopathy according to claim 1 wherein said compound having an omega-9 unsaturated fatty acid as a constituent fatty acid is an alcohol ester of an omega-9 unsaturated fatty acid, a monoglyceride, a diglyceride and/or a triglyceride, or a phospholipid having an omega-9 unsaturated fatty acid as a constituent fatty acid.

3. The preventive or ameliorating agent for liver diseases associated with hepatopathy according to claim 2 wherein said triglyceride having an omega-9 unsaturated fatty acid as a constituent fatty acid contains 20% or more of the omega-9 unsaturated fatty acid relative to the total fatty acids constituting said triglyceride.

4. The preventive or ameliorating agent for liver diseases associated with hepatopathy according to any one of claims 1 to 3 wherein said omega-9 unsaturated fatty acid is at least one selected from the group consisting of 6,9-octadecadienoic acid (18:2  $\omega$ 9), 8,11-eicosadienoic acid (20:2  $\omega$ 9) and 5,8,11-eicosatrienoic acid (20:3  $\omega$ 9).

5. The preventive or ameliorating agent for liver diseases associated with hepatopathy according to any one of claims 1 to 4 wherein said triglyceride having an omega-9 unsaturated fatty acid as a constituent fatty acid is obtained by culturing a microorganism having a reduced or absent  $\Delta$ 12 unsaturating enzyme activity in a medium, said microorganism being obtained by the mutation treatment of a microorganism belonging to genus *Mortierella*, genus *Conidiobolus*, genus *Phythium*, genus *Phytophthora*, genus *Penicillium*, genus *Cladosporium*, genus *Mucor*, genus *Fusarium*, genus *Aspergillus*, genus

Rhodotorula, genus Entomophthora, genus Echinosporangium, or genus Saprolegnia and being capable of producing arachidonic acid, and then extracting from said culture.

5       6.    The preventive or ameliorating agent according to any one of claims 1 to 5 wherein said liver diseases associated with hepatopathy are acute or chronic hepatitis.

10       7.    The preventive or ameliorating agent according to any one of claims 1 to 5 wherein said liver diseases associated with hepatopathy are acute hepatic insufficiency, liver cirrhosis and/or hepatoma.

15       8.    A composition or a food or drink having an effect of preventing or ameliorating liver diseases associated with hepatopathy comprising an omega-9 unsaturated fatty acid or a compound having an omega-9 unsaturated fatty acid as a constituent fatty acid.

20       9.    The composition or the food or drink having an effect of preventing or ameliorating liver diseases associated with hepatopathy according to claim 8 wherein said compound having an omega-9 unsaturated fatty acid as a constituent fatty acid is an alcohol ester of an omega-9 unsaturated fatty acid, a monoglyceride, a diglyceride and/or a triglyceride, or a phospholipid having an omega-9 unsaturated fatty acid as a constituent fatty acid.

25       10.   The composition or the food or drink having an effect of preventing or ameliorating liver diseases associated with hepatopathy according to claim 9 wherein said triglyceride having an omega-9 unsaturated fatty acid as a constituent fatty acid contains 20% or more of the omega-9 unsaturated fatty acid relative to the total fatty acids constituting said triglyceride.

30       11.   The composition or the food or drink having an effect of preventing or ameliorating liver diseases associated with hepatopathy according to any one of claims 8 to 10 wherein said omega-9 unsaturated fatty acid is at least one selected from the group consisting of 6,9-octadecadienoic acid (18:2  $\omega$ 9), 8,11-eicosadienoic

acid (20:2 ω9) and 5,8,11-eicosatrienoic acid (20:3 ω9).

12. The composition or the food or drink having an effect of preventing or ameliorating liver diseases associated with hepatopathy according to any one of  
5 claims 8 to 11 wherein said triglyceride having an omega-9 unsaturated fatty acid as a constituent fatty acid is obtained by culturing a microorganism having a reduced or absent Δ12 unsaturating enzyme activity in a medium, said microorganism being obtained by the mutation treatment of  
10 a microorganism belonging to genus Mortierella, genus Conidiobolus, genus Phythium, genus Phytophthora, genus Penicillium, genus Cladosporium, genus Mucor, genus Fusarium, genus Aspergillus, genus Rhodotorula, genus Entomophthora, genus Echinosporangium, or genus  
15 Saprolegnia and being capable of producing arachidonic acid, and then extracting it from said culture.

13. The composition or the food or drink having a preventing or ameliorating effect according to any one of claims 8 to 12 wherein said liver diseases associated  
20 with hepatopathy are acute or chronic hepatitis.

14. The composition or the food or drink having a preventing or ameliorating effect according to any one of claims 8 to 12 wherein said liver diseases associated with hepatopathy are acute hepatic insufficiency, liver  
25 cirrhosis and/or hepatoma.

15. The composition or the food or drink having an effect of preventing or ameliorating liver diseases associated with hepatopathy according to any one of claims 8 to 14 wherein said a food or drink are  
30 functional foods, nutrient supplements, specified health foods or foods for old people.

16. A method of preparing ingest having an effect of preventing or ameliorating liver diseases associated with hepatopathy wherein an omega-9 unsaturated fatty  
35 acid or a compound having an omega-9 unsaturated fatty acid as a constituent fatty acid is blended with a raw material for a food or drink containing substantially no

or very little omega-9 unsaturated fatty acid.

17. A method of preventing or ameliorating liver diseases associated with hepatopathy wherein an omega-9 unsaturated fatty acid or a compound having an omega-9  
5 unsaturated fatty acid as a constituent fatty acid is administered to a subject.

18. The method according to claim 17 wherein said compound having an omega-9 unsaturated fatty acid as a constituent fatty acid is an alcohol ester of an omega-9  
10 unsaturated fatty acid, a monoglyceride, a diglyceride and/or a triglyceride, or a phospholipid having an omega-9 unsaturated fatty acid as a constituent fatty acid.

19. The method according to claim 18 wherein said triglyceride having an omega-9 unsaturated fatty acid as  
15 a constituent fatty acid contains 20% or more of the omega-9 unsaturated fatty acid relative to the total fatty acids constituting said triglyceride.

20. The method according to any one of claims 17 to 19 wherein said omega-9 unsaturated fatty acid is at  
20 least one selected from the group consisting of 6,9-octadecadienoic acid (18:2  $\omega$ 9), 8,11-eicosadienoic acid (20:2  $\omega$ 9) and 5,8,11-eicosatrienoic acid (20:3  $\omega$ 9).

21. The method according to any one of claims 17 to 20 wherein said triglyceride having an omega-9  
25 unsaturated fatty acid as a constituent fatty acid is obtained by culturing a microorganism having a reduced or absent  $\Delta$ 12 unsaturating enzyme activity in a medium, said microorganism being obtained by the mutation treatment of a microorganism belonging to genus *Mortierella*, genus  
30 *Conidiobolus*, genus *Phythium*, genus *Phytophthora*, genus *Penicillium*, genus *Cladosporium*, genus *Mucor*, genus *Fusarium*, genus *Aspergillus*, genus *Rhodotorula*, genus *Entomophthora*, genus *Echinosporangium*, or genus *Saprolegnia* and being capable of producing arachidonic  
35 acid, and then extracting from said culture.

22. The method according to any one of claims 17 to

21 wherein said liver diseases associated with  
hepatopathy are acute or chronic hepatitis.

23. The method according to any one of claims 17 to  
21 wherein said liver diseases associated with  
5 hepatopathy are acute hepatic insufficiency, liver  
cirrhosis and/or hepatoma.

24. A method of preventing or ameliorating liver  
diseases associated with hepatopathy which comprises  
providing a composition or a food or drink containing an  
10 omega-9 unsaturated fatty acid or a compound having an  
omega-9 unsaturated fatty acid as a constituent fatty  
acid.

25. The method according to claim 24 wherein said  
compound having an omega-9 unsaturated fatty acid as a  
15 constituent fatty acid is an alcohol ester of an omega-9  
unsaturated fatty acid, a monoglyceride, a diglyceride  
and/or a triglyceride, or a phospholipid having an omega-  
9 unsaturated fatty acid as a constituent fatty acid.

26. The method according to claim 25 wherein said  
20 triglyceride having an omega-9 unsaturated fatty acid as  
a constituent fatty acid contains 20% or more of the  
omega-9 unsaturated fatty acid relative to the total  
fatty acids constituting said triglyceride.

27. The method according to any one of claims 24 to  
25 26 wherein said omega-9 unsaturated fatty acid is at  
least one selected from the group consisting of 6,9-  
octadecadienoic acid (18:2  $\omega$ 9), 8,11-eicosadienoic acid  
(20:2  $\omega$ 9) and 5,8,11-eicosatrienoic acid (20:3  $\omega$ 9).

28. The method according to any one of claims 24 to  
30 27 wherein said triglyceride having an omega-9  
unsaturated fatty acid as a constituent fatty acid is  
obtained by culturing a microorganism having a reduced or  
absent  $\Delta$ 12 unsaturating enzyme activity in a medium, said  
microorganism being obtained by the mutation treatment of  
35 a microorganism belonging to genus *Mortierella*, genus  
*Conidiobolus*, genus *Phythium*, genus *Phytophthora*, genus

Penicillium, genus Cladosporium, genus Mucor, genus Fusarium, genus Aspergillus, genus Rhodotorula, genus Entomophthora, genus Echinosporangium, or genus Saprolegnia and being capable of producing arachidonic acid, and then extracting it from said culture.

29. The method according to any one of claims 24 to 28 wherein said liver diseases associated with hepatopathy are acute or chronic hepatitis.

30. The method according to any one of claims 24 to 28 wherein said liver diseases associated with hepatopathy are acute hepatic insufficiency, liver cirrhosis and/or hepatoma.

31. The method according to any one of claims 24 to 30 wherein said a food or drink are functional foods, nutrient supplements, specified health foods or foods for old people.

32. A use of an omega-9 unsaturated fatty acid or a compound having an omega-9 unsaturated fatty acid as a constituent fatty acid for the preparation of a preventive or ameliorating agent for liver diseases associated with hepatopathy.

33. The use according to claim 32 wherein said compound having an omega-9 unsaturated fatty acid as a constituent fatty acid is an alcohol ester of an omega-9 unsaturated fatty acid, a monoglyceride, a diglyceride and/or a triglyceride, or a phospholipid having an omega-9 unsaturated fatty acid as a constituent fatty acid.

34. The use according to claim 33 wherein said triglyceride having an omega-9 unsaturated fatty acid as a constituent fatty acid contains 20% or more of the omega-9 unsaturated fatty acid relative to the total fatty acids constituting said triglyceride.

35. The use according to any one of claims 32 to 34 wherein said omega-9 unsaturated fatty acid is at least one selected from the group consisting of 6,9-octadecadienoic acid (18:2  $\omega$ 9), 8,11-eicosadienoic acid (20:2  $\omega$ 9) and 5,8,11-eicosatrienoic acid (20:3  $\omega$ 9).

36. The use according to any one of claims 32 to 35 wherein said triglyceride having an omega-9 unsaturated fatty acid as a constituent fatty acid is obtained by culturing a microorganism having a reduced or absent  $\Delta 12$  unsaturating enzyme activity in a medium, said  
5 microorganism being obtained by the mutation treatment of a microorganism belonging to genus *Mortierella*, genus *Conidiobolus*, genus *Phythium*, genus *Phytophthora*, genus *Penicillium*, genus *Cladosporium*, genus *Mucor*, genus  
10 *Fusarium*, genus *Aspergillus*, genus *Rhodotorula*, genus *Entomophthora*, genus *Echinosporangium*, or genus *Saprolegnia* and being capable of producing arachidonic acid, and then extracting it from said culture.

37. The use according to any one of claims 32 to 36 wherein said liver diseases associated with hepatopathy are acute or chronic hepatitis.  
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38. The use according to any one of claims 32 to 36 wherein said liver diseases associated with hepatopathy are acute hepatic insufficiency, liver cirrhosis and/or  
20 hepatoma.

39. The use of an omega-9 unsaturated fatty acid or a compound having an omega-9 unsaturated fatty acid as a constituent fatty acid for the preparation of a composition or a food or drink having an effect of  
25 preventing or ameliorating liver diseases associated with hepatopathy.

40. The use according to claim 39 wherein said compound having an omega-9 unsaturated fatty acid as a constituent fatty acid is an alcohol ester of an omega-9  
30 unsaturated fatty acid, a monoglyceride, a diglyceride and/or a triglyceride, or a phospholipid having an omega-9 unsaturated fatty acid as a constituent fatty acid.

41. The use according to claim 40 wherein said triglyceride having an omega-9 unsaturated fatty acid as  
35 a constituent fatty acid contains 20% or more of the omega-9 unsaturated fatty acid relative to the total fatty acids constituting said triglyceride.

42. The use according to any one of claims 39 to 41 wherein said omega-9 unsaturated fatty acid is at least one selected from the group consisting of 6,9-octadecadienoic acid (18:2 ω9), 8,11-eicosadienoic acid (20:2 ω9) and 5,8,11-eicosatrienoic acid (20:3 ω9).

43. The use according to any one of claims 39 to 42 wherein said triglyceride having an omega-9 unsaturated fatty acid as a constituent fatty acid is obtained by culturing a microorganism having a reduced or absent Δ12 unsaturating enzyme activity in a medium, said microorganism being obtained by the mutation treatment of a microorganism belonging to genus *Mortierella*, genus *Conidiobolus*, genus *Phythium*, genus *Phytophthora*, genus *Penicillium*, genus *Cladosporium*, genus *Mucor*, genus *Fusarium*, genus *Aspergillus*, genus *Rhodotorula*, genus *Entomophthora*, genus *Echinosporangium*, or genus *Saprolegnia* and being capable of producing arachidonic acid, and then extracting it from said culture.

44. The use according to any one of claims 39 to 43 wherein said liver diseases associated with hepatopathy are acute or chronic hepatitis.

45. The use according to any one of claims 39 to 43 wherein said liver diseases associated with hepatopathy are acute hepatic insufficiency, liver cirrhosis and/or hepatoma.

46. The use according to any one of claims 39 to 45 wherein said a food or drink are functional foods, nutrient supplements, specified health foods or foods for old people.